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Claims

1 1. An electronic key system which provides services
2 with the use of an electronic key, said system comprising:
3 a user module which has stored electronic key data
4 having a main ID and a sub ID to identify an electronic key,
5 and a service providing device which judges allowance or
6 denial of provision of services,
7 wherein:
8 said user module comprises
9 accepting means which accepts an electronic key
10 transmission request from said service providing device,
11 and
12 transmitting means which transmits said electronic key
13 data to said service providing device;
14 said service providing device comprises
15 storing means which stores service allowance
16 information to allow the provision of services and service
17 denial information to deny the provision of services,
18 accepting means which accepts said electronic key data
19 from said user module,
20 first judging means which judges whether the main ID
21 in said accepted electronic key data is present in said service
22 allowance information,
23 second judging means which judges whether the sub ID
24 in said accepted electronic key data is present in said service

25 denial information, and
26 provision judging means which judges allowance or
27 denial of the provision of services according to results
28 of said first and second judgments.

1 2. The electronic key system according to Claim 1,
2 wherein:

3 said provision judging means allows the provision of
4 services when said first judging means judges that the main
5 ID is present in said service allowance table and said second
6 judging means judges that the sub ID is absent in said service
7 denial table.

1 3. The electronic key system according to Claim 1,
2 wherein:

3 said electronic key data comprises shared hierarchy
4 data indicating whether the electronic key can be shared
5 or not; and

6 said user module further comprises generating means
7 which generates an electronic key to be shared, having a
8 same main ID and a different sub ID, when the shared hierarchy
9 data indicates that the electronic key can be shared.

1 4. The electronic key system according to Claim 1,
2 further comprising:

3 an electronic key managing apparatus which manages an

4 electronic key service,
5 wherein:
6 said electronic key managing apparatus comprises
7 a means which stores a client table containing a
8 membership number and a sub ID to identify a user,
9 accepting means which accepts the membership number
10 and the sub ID from an external system,
11 invalidation judging means which judges whether the
12 sub ID in said client table corresponding to the accepted
13 membership number matches with the accepted sub ID and judges,
14 according to a result of said judgment, whether entire
15 invalidation processing for invaliding all user modules
16 having a same main ID or partial invalidation processing
17 for invalidating only a user module having a same sub ID
18 is to be performed, and
19 transmitting means which transmits a result of said
20 invalidation judgment to said service providing device; and
21 said service providing device further comprises
22 changing means which changes said service denial table or
23 said service allowance table according to the result of said
24 invalidation judgment.

1 5. A user module which has stored electronic key data
2 used in judging allowance or denial of provision of services
3 by a service providing device which provides services,
4 wherein:

5 said electronic key data comprises main ID data and
6 sub ID data to identify an electronic key; and
7 said user module comprises transmission request
8 accepting means which accepts an electronic key transmission
9 request from said service providing device, and transmitting
10 means which transmits said electronic key data to said service
11 providing device.

1 6. The user module according to Claim 5,
2 wherein said electronic key data s shared hierarchy data
3 indicating whether the electronic key can be shared or not,
4 and
5 wherein said user module further comprises:
6 sharing request accepting means which accepts an
7 electronic key sharing request;
8 generating means which generates electronic key data
9 to be shared, having a same main ID and a different sub ID,
10 when the electronic key can be shared; and
11 transmitting means which transmits said generated
12 electronic key data to be shared to an external system.

1 7. The user module according to Claim 6, further
2 comprising:
3 sharing judging means which judges that the electronic
4 key cannot be shared when the shared hierarchy data has a
5 specific value and the electronic key can be shared when

6 the shared hierarchy data has a value other than said specific
7 value,
8 wherein said generating means generates said
9 electronic key data to be shared by changing the value of
10 the shared hierarchy data in said electronic key data by
11 subtracting "1" therefrom.

1 8. A service providing device which judges allowance
2 or denial of provision of services with the use of electronic
3 key data stored in a user module, said device comprising:
4 storing means which stores service allowance
5 information to allow the provision of services, and service
6 denial information to deny the provision of services;
7 accepting means which accepts said electronic key data
8 from said user module; and
9 judging means which judges allowance or denial of the
10 provision of service for said accepted electronic key data
11 on the basis of said accepted electronic key data, said service
12 allowance information, and said service denial information.

1 9. The service providing device according to Claim 8,
2 wherein:
3 said electronic key data comprises main ID data and
4 sub ID data to identify an electronic key; and
5 said judging means comprises first judging means which
6 judges whether a main ID in said accepted electronic key

7 data is present in said service allowance information, and
8 second judging means which judges whether a sub ID in said
9 accepted electronic key data is present in said service denial
10 information, and judges allowance or denial of the provision
11 of services for said accepted electronic key data according
12 to results of said first and second judgments.

1 10. A service providing device which judges allowance
2 or denial of provision of services with the use of electronic
3 key data stored in a user module,
4 wherein:

5 said electronic key data comprises main ID data and
6 sub ID data to identify an electronic key;

7 said service providing device comprises storing means
8 which stores service allowance information to allow the
9 provision of services and service denial information to deny
10 the provision of services;

11 invalidation accepting means which accepts a command
12 for partial invalidation or a command for entire invalidation
13 of the electronic key from said user module;

14 appending means which appends, when the command for
15 the partial invalidation is accepted, main ID data and sub
16 ID data contained in said command to said service denial
17 information; and

18 deleting means which deletes, when the command for the
19 entire invalidation is accepted, main ID data contained in

20. said command from said service allowance information.

1 11. An electronic key managing apparatus which manages
2 electronic key data to receive provision of services, said
3 apparatus comprising:

4 storing means which stores electronic key data having
5 main ID data to identify an electronic key, sub ID data to
6 identify the electronic key, and shared hierarchy data
7 indicating a range within which the electronic key can be
8 shared;

9 sharing requesting means which accepts a sharing
10 request of the electronic key containing the sub ID data
11 inputted from a linked-terminal apparatus via a network;

12 sharing judging means which judges whether the
13 electronic key can be shared or not with reference to the
14 shared hierarchy data; and

15 generating means which generates electronic key data
16 to be shared when the electronic key can be shared.

1 12. An electronic key managing apparatus which manages
2 electronic key data to receive provision of services, said
3 apparatus comprising:

4 storing means which stores service allowance
5 information to allow the provision of services and service
6 denial information to deny the provision of services;

7 accepting means which accepts electronic key data from

8 an external system; and
9 judging means which judges allowance or denial of the
10 provision of services for said accepted electronic key data
11 on the basis of said accepted electronic key data, said service
12 allowance information, and said service denial information.

1 13. A door locking/unlocking system which locks or
2 unlocks a door of a residence with the use of an electronic
3 key, said system comprising:

4 an IC card which has stored electronic key data having
5 a main ID and a sub ID to identify an electronic key, and
6 a device which locks or unlocks the door by judging validity
7 of said electronic key data,

8 wherein:

9 said IC card comprises transmitting means which accepts
10 an electronic key transmission request from said device and
11 transmits said electronic key data to said device; and

12 said device comprises

13 storing means which stores service allowance
14 information to allow the provision of services and service
15 denial information to deny the provision of services,

16 accepting means which accepts said electronic key data
17 from said IC card,

18 first judging means which judges whether the main ID
19 in said accepted electronic key data is present in said service
20 allowance information,

21 second judging means which judges whether the sub ID
22 insaidacceptedelectronickeydataispresentinsaidservice
23 denial information, and

24 performing means which locks or unlocks the door by
25 judging the validity of said accepted electronic key data
26 according to results of said first and second judgments.

1 14. A rental car service system which provides a key
2 of a rental car to a user with the use of an electronic key
3 as the key of the rental car, said system comprising:

4 an IC card which has stored electronic key data having
5 a main ID and a sub ID to identify the electronic key, a
6 device which allows the use of the rental car by judging
7 validity of said electronic key data, and an electronic key
8 managing apparatus which manages said electronic key data
9 to receive the provision of services,

10 wherein:

11 said electronic key managing apparatus comprises
12 generating means which generates an electronic key having
13 a main ID and a sub ID to identify a rental car selected
14 from an external system, transmitting means which transmits
15 said generated electronic key to the IC card of the user,
16 and transmitting means which transmits said main ID to said
17 device;

18 said IC card comprises storing means which stores said
19 generated electronic key; and

20 said device comprises storing means which stores said
21 transmitted main ID into service allowance information to
22 allow the provision of services.

1 15. A program of a computer apparatus used for a service
2 providing device which judges allowance or denial of
3 provision of services to judge allowance or denial of the
4 provision of services, said program causing said computer
5 apparatus to activate:

6 storing means which stores main ID data and sub ID data
7 to identify an electronic key; and

8 transmission request accepting means which accepts an
9 electronic key transmission request from said service
10 providing device, and transmitting means which transmits
11 said electronic key data to said service providing device.

1 16. The program according to Claim 15, further causing
2 said computer apparatus to activate:

3 storing means which stores shared hierarchy data
4 indicating whether the electronic key can be shared;

5 sharing request accepting means which accepts an
6 electronic key sharing request;

7 generating means which generates electronic key data
8 to be shared, having a same main ID and a different sub ID,
9 when the electronic key can be shared; and

10 transmitting means which transmits said generated

11 electronic key data to be shared to an external system.

1 17. A program readable by a computer apparatus for
2 judging allowance or denial of provision of services which
3 causes the computer apparatus to judge allowance or denial
4 of the provision of services with the use of electronic key
5 data stored in a user module, said program causing said
6 computer apparatus to activate:

7 storing means which stores service allowance
8 information to allow the provision of services and service
9 denial information to deny the provision of services;

10 accepting means which accepts said electronic key data
11 from said user module; and

12 judging means which judges allowance or denial of the
13 provision of services for said accepted electronic key data
14 on the basis of said accepted electronic key data, said service
15 allowance information, and said service denial information.

1 18. An electronic key usage method which provides
2 services with the use of an electronic key, said method
3 comprising:

4 a storing step of storing service allowance information
5 to allow the provision of services and service denial
6 information to deny the provision of services;

7 an accepting step of accepting electronic key data,
8 containing main ID data and sub ID data to identify an

9 electronic key, from an external system;
10 a first judging step of judging whether a main ID of
11 said accepted electronic key data is present in said service
12 allowance information;
13 a second judging step of judging whether a sub ID of
14 said accepted electronic key data is present in said service
15 denial information; and
16 a provision allowance/denial judging step of judging
17 allowance or denial of the provision of services for said
18 accepted electronic key data according to results of said
19 first and second judging steps.